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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/654,996	09/05/2003	Hiroki Kanai	500.43106X00	6684

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ALEXANDRIA, VA 22314

EXAMINER
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ELMORE, REBA I

ART UNIT	PAPER NUMBER
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2189

DATE MAILED: 03/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/654,996

Applicant(s)

KANAI, HIROKI

Examiner

Reba I. Elmore

Art Unit

2189

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/31/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

1. Claims 1-20 are presented for examination.

### *SPECIFICATION*

2. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### *35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshida.
5. Yoshida teaches the invention (claim 1) as claimed including a storage device control apparatus comprising:

a mounting part for removable memory as disk memory storage systems (e.g., see Figure 1);

channel control units with a host interface controller for receiving data I/O requests (e.g., see element 11 of Figure 1);

disk control units which have disk interface controllers for performing I/O control of the data to storage volumes in response to the data I/O requests (e.g., see Figure 1);

cache memory units (e.g., see element 14 of Figure 1);

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storage control units having a host interface controller, disk interface controller and memory (e.g., see paragraph 0010 and Figures 2-3); and,

an internal connection part for connecting the channel control units, the disk control units, the cache memory units and the storage control units (e.g., see Figures 1-4).

As to claim 2, Yoshida teaches information for specifying the storage volumes specified by the disk control unit which performs I/O control and information to which another storage control unit performs I/O control is stored in the memory of the storage control unit (e.g., see paragraph 0021).

As to claim 3, Yoshida teaches a first storage area for storing the data in storage volumes for the storage control unit performing I/O control (e.g., see paragraph 0021 and paragraphs 0037-0039 and Figure 4); a second storage area for storing the data to be stored in the storage volumes for the storage control unit performing the I/O control (e.g., see paragraph 0021 and paragraphs 0037-0039 and Figure 4) and information for specifying the first and second storage areas are stored in the memory of the storage control unit (e.g., see paragraph 0021 and paragraphs 0037-0039 and Figure 4).

As to claim 4, Yoshida teaches the storage control unit includes a communication buffer for storing data exchanged with another storage control unit as the transfer control unit (e.g., see Figure 4).

6. Yoshida teaches the invention (claim 5) as claimed including a control method for a storage device control apparatus including:

a mounting part for removably mounting a memory device as disk memory storage systems (e.g., see Figure 1);

channel control units having a host interface controller for receiving data I/O requests as channel interface units (e.g., see Figure 4);

disk control units which have a disk interface controller for performing I/O control of the data to storage volumes storing data in response to the data I/O requests (e.g., see Figure 4)

cache memory units (e.g., see Figure 4);

storage control units having a host interface controller, the disk interface controller and memory (e.g., see Figure 2-3 and paragraph 0010);

an internal connection part for connection part for connecting the channel control unit, the disk control unit, the cache memory unit and the storage control unit (e.g., see Figures 1-4);

a plurality of storage control units which hold information for identifying a unit to perform I/O control to a storage volume in each memory with each I/O request is directed to a mounted disk (e.g., see Figures 1-4);

receiving the data I/O request at one of the storage control units (e.g., see Figure 4 and paragraphs 0037 to 0043);

referring to the information by the storage control unit to identify the unit to perform I/O control to the storage volume to which the data I/O request is directed (e.g., see Figure 4 and paragraphs 0037-0043); and,

performing the I/O control by the storage control unit when the unit to perform the I/O control is the storage control unit, or letting another storage control unit perform the I/O control when the unit to perform the I/O control is not the storage control unit (e.g., see Figure 4 and paragraphs 0037-0043).

As to claim 6, Yoshida teaches sending the read request to another storage control unit by the storage control unit; performing the I/O control in response to the read request by another storage control unit; and sending the received data to an information processing apparatus by the storage control unit (e.g., see Figure 4 and paragraphs 0037-0043).

As to claim 7, Yoshida teaches sending the write request and write data to another storage control unit by the storage control unit and performing the I/O control of the write data in response to the write request by another storage control unit (e.g., see Figure 4 and paragraphs 0037-0043).

As to claim 8, Yoshida teaches receiving the data from another storage control unit data indicating the completion of the I/O control of the write data (e.g., see Figure 4 and paragraphs 0037-0043).

As to claim 9, Yoshida teaches sending the read request to another storage control unit by the storage control unit; writing the read request into a buffer in another storage control unit; reading the read request into a buffer of another storage control unit by the original unit; receiving data from another control unit by the storage control unit by reading the data written by another storage control unit in the buffer provided in the storage control unit by the storage control unit (e.g., see Figure 4 and paragraphs 0037-0043);

As to claim 10, Yoshida teaches the buffer for storing data exchanged with another storage control unit; sending the write request and write data to another storage control unit by the storage control unit; writing the write request and the write data into a buffer provided in another storage control unit by the storage control unit and reading the write request and the

write data from the buffer to another storage control unit by the same storage control unit (e.g., see Figure 4 and paragraphs 0037-0043).

As to claim 11, Yoshida teaches receiving data indicating the I/O control of the write data has been completed from another storage control unit by the storage control unit by reading the data written by another storage control unit in the buffer provided in the storage control unit by the same storage control unit (e.g., see Figure 4 and paragraphs 0037-0043).

As to claim 12, Yoshida teaches receiving the data I/O request by the storage control unit; referring to the information by the storage control unit to identify the unit to perform the I/O control to the storage volume for the directed I/O request; and performing the I/O control by the storage control unit when the unit to perform the I/O control is the storage control unit or performing the I/O control by the disk control unit when the unit to perform the I/O control is not the storage control unit (e.g., see Figure 4 and paragraphs 0037-0043).

As to claim 13, Yoshida teaches sending the read request to the disk control unit by the storage control unit; performing the I/O control in response to the read request by the disk control unit; receiving data from the disk control unit by the storage control unit and sending the received data to an information processing apparatus by the storage control unit (e.g., see Figure 4 and paragraphs 0037-0043).

As to claim 14, Yoshida teaches sending the write request and write data to the disk control unit by the storage control unit and performing the I/O control of the write data in response to the write request by the storage control unit (e.g., see Figure 4 and paragraphs 0037-0043).

As to claim 15, Yoshida teaches a first storage area for storing the data to be stored in the storage volumes for performing I/O control; a second storage area for storing the data to be stored in the storage volumes for the disk control unit performing I/O control; when the storage control unit performs I/O control of the data to the first storage area or when the unit to perform the I/O control is not the storage control unit, the disk control unit performs the I/O control of the data to the second storage area (e.g., see Figure 4 and paragraphs 0037-0043).

As to claim 16, Yoshida teaches receiving the data I/O request by one of the storage control units; referring to the information by the storage control unit to identify the unit to perform the I/O control to the storage volume to which the data I/O request is directed (e.g., see Figure 4 and paragraphs 0037-0043).

As to claim 17, Yoshida teaches a first storage area for storing the data to be stored in the storage volumes for performing I/O control; a second storage area for storing data in the storage volumes performing I/O control with the control method receiving a data I/O request by the storage control unit, referring to the information by the storage control unit to identify the unit performing the I/O control to the storage volume for the directed data I/O request, performing the I/O control to the first storage area by the storage control unit when the unit for perform the I/O control is the storage control unit and performing the I/O control to the storage volume by the storage control unit when the data is not stored in the cache memory unit (e.g., see Figure 4 and paragraphs 0037-0043).

As to claim 18, Yoshida teaches a first storage area for storing the data to be stored in the storage volumes to which the storage control unit performs I/O control, the second storage area for storing the data to be stored in the storage volumes to which the disk control unit performs



I/O control with the control method receives a data I/O request by the storage control unit, referring to the information by the storage control unit to identify the unit to perform the I/O control to the storage volume to which the data I/O request is directed, performing the I/O control to the second storage area by the storage control unit when the unit to perform the I/O control is the disk control unit performing the I/O control to the cache memory unit by the storage control unit when the data is not stored in the second storage disk and perform the I/O control to the storage volume by the storage control unit when the data is not stored in the cache memory unit (e.g., see Figure 4 and paragraphs 0037-0043).

As to the claim 19, Yoshida teaches duplicating information stored in the memory of each of the storage control units by each of the storage control units, for identifying the unit to perform the I/O control to the storage volume to which the data I/O request is directed and write the duplicated information into the cache memory unit, referring to the information by the storage control unit to identify the unit to perform the I/O control to the storage volume to which the I/O request is directed by referring to the information in the cache memory unit by the storage control unit to identify the unit when the storage control unit cannot identify the unit merely by consulting the information stored in the memory of the storage control unit (e.g., see Figure 4 and paragraphs 0019 and 0037-0043).

As to claim 20, Yoshida teaches duplicating the data stored in the storage volume to which the storage control unit performs I/O control by one of the storage control units, write the duplicated data into the storage volume to which the disk control unit performs I/O control and changing the information, stored in the respective memories of the storage control unit and

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another storage control unit for identifying the unit to perform the I/O control, from the storage control unit to the disk control unit (e.g., see Figure 4 and paragraphs 0019 and 0037-0043).

### ***CONCLUSION***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Reba I. Elmore, whose telephone number is (571) 272-4192. The examiner can normally be reached on Monday or Wednesday from 7:30am to 6:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the art unit supervisor for AU 2189, Reginald G. Bragdon, can be reached for general questions concerning this application at (571) 272-4204. Additionally, the official fax phone number for the art unit is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Tech Center central telephone number is (571) 272-2100.



Reba I. Elmore  
Primary Patent Examiner  
Art Unit 2189

Sunday, March 19, 2006

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